METHODS OF CODING INFORMATION IN LOCAL NETWORKS UNDER THE ACTION OF EXTERNAL INTERFERENCE

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The current trend of growth in traffic volumes in control and telemetry systems requires timely and reliable means of transmitting information in the network. Coding information at the physical level allows in most cases to solve the problem of recognizing and correcting distorted data. However, because of the complexity of solving the problem by means of physical level, it is also solved by using higher-level protocols. At the same time, error recognition at the physical level allows to save network resources. Depending on the coding method, the complexity of network equipment varies, the technical characteristics of which significantly affect the reliability and speed of information transfer. At the same time, coding methods provide good reception synchronization, low error rate and work with coded information sequences of unlimited length.

To the methods of encoding information in local networks, conflicting requirements are presented, the coordination of which is possible only if they are reasonably analyzed. Therefore, the analysis of coding methods, the determination of their advantages and disadvantages, on the basis of which the most optimal coding methods are applied in the presence of interference, determines the relevance of the work.

In the work, the comparative analysis of existing methods of coding in local networks is carried out. The most common coding methods are considered: NRZ, NRZI, AMI, RZ, Manchester-II, MLT-3 and 4B/5B. On the basis of the analysis, it was determined that the Manchester-II and MLT-3 codes better than others solve data transmission problems in conditions of interference. So the Manchester-II code makes it easy to allocate a synchronizing signal that allows to transmit information in batches of any size without their loss due to synchronization breaks. The spectrum of its signal is wider than the NRZ and AMI codes. The signal does not have a constant component, it allows galvanic isolation between local network units. This significantly reduces the influence of powerful external noise, increasing the noise immunity of the system. The MLT-3 code has a narrow signal spectrum, but there is no self-synchronization. The code structure allows to identify all single errors, and due to the alternation of three signal levels (positive, negative and zero), the necessary bandwidth is narrowed. Sharing MLT-3 with a 4B/5B circuit allows to ensure that there are enough transitions in the source signal to use them as synchronization. As a result of this coding scheme is much more efficient than Manchester-II. Thus, in local networks under the conditions of powerful external interference, potential encoding should be applied, followed by elimination of its shortcomings with the help of logical coding.